USSR

UDC: 621.375.132:621.375.4(088.8)

BAZAROV, B. V., LAVRENT'YEV, G. F., RAZORENOV, N. Ye.

"An AC Amplifier"

USSR Author's Certificate No 221054, filed 3 Jun 66, published 3 Dec 70 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6D119 P)

Translation: An AC amplifier is proposed with a phase-sensitive rectifier with negative feedback proportional to the direct current of the load. To simplify the design and improve reliability, the primary winding of the feedback transformer is connected in series with the switches of the phase-sensitive rectifier, and the secondary winding is connected to the input of the AC amplifier.

1/1

USSR

UDC 669.15.018.44

ALEKSEYENKO, N. N., GORYNIN, I. V., YEFIMOV, A. V., RAZOV, I. A., SIKORSKIY, O. F.

"Effect of Scale and Neutron Irradiation When Testing 15Kh2MFA Heat-Resistant Steel"

Metallovedeniye -- V sb. (Physical Metallurgy -- collection of works), No 14, Leningrad, Sudostroyeniye Press, 1970, pp 186-193 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4I635)

Translation: The effect of the scaling factor on improving the critical embrittlement temperature of 15Kh2MFA heat-resistant steel is studied. It is established that the magnitude of the scaling effect is reached in 80-100 mm samples, and it is ~50°. Neutron irradiation at 150° with a dose of 10^{20} neutrons/cm^2 (E > 1 megaelectron volt) lowers the scaling effect somewhat with an increase in sample size from 5 to 10 mm. It is demonstrated that low sensitivity of this steel to scale and also to loading rate and neutron irradiation arises from its alloying and uniform structure of the sorbite as a result of quenching and tempering. There are 2 illustrations, 6 tables, and a 14-entry bibliography.

1/1

USSR

UDC 539.375

RAZOV, I. A.

"Brittle Fracture of Welded Structural Elements and Their Relation to the Stressed State and Inclination of Steel Toward Embrittlement"

V sb. Khladostoykost' stali i stal'n. konstruktsiy (Cold Resistance of Steel and Steel Structural Elements--collection of works), Novosibirsk, Nauka Press, 1971, pp 71-86 (from RZh-Mekhanika, No 11, Nov 71, Abstract 11V529)

Translation: It is reported that brittle fracture from cold brittleness occurs in two stages. The first stage is the occurrence of a center of brittle fracture, the occurrence of the first microcrack which can be of a brittle, fatigue or even viscous nature and achievement of a microcrack of critical dimensions. The second stage is spread of the brittle fracture in the structural element. In the author's opinion, the second stage presents the greatest danger for welded structural elements; therefore, basic attention is given to it in this article. It is demonstrated that the factors determining the propagation of brittle fracture are the following: 1) increased inclination of the steel toward cold brittleness; 2) residual stresses (independently of the cause of their occurrence); 3) the level of the external load; 4) the operating temperature; 5) the presence of technological or structural centers of stress concentration. 1/4

USSR

RAZOV, I. A., Khladostoykost' stali i stal'n. konstruktsiy, Novosibirsk, Nauka Press, 1971, pp 71-86

A brief study was made of methods of estimating the critical embrittlement temperature T_{cr} characterizing the inclination of the steel toward cold embrittlement. The author considers that in order to consider the effect of the stress concentration, it is necessary to determine T_{cr} by the impact toughness only in test pieces with a sharp notch (on the order of 0.2-0.3 mm); in addition, the sharp notch promotes early occurrence of the crack, that is, the work of crack formation is insignificant, and the total impact work actually characterizes the resistance of the steel to crack propagation. The relations between the values of T_{cr} determined by different procedures used in the USSR and in the USA are presented, and the relations between the American criteria and our criteria for inclination of steel toward brittle fracture are established. The necessity for developing an All-Union State Standard or standard designs for estimating the brittleness of steel which will permit comparison of the data from various studies among each other is stated. The important role of residual stresses by which we primarily mean stresses from welding, assembly, thermal stresses, and so on and also the role of the operating temperature are noted. 2/4

USSR

RAZOV, I. A., Khladostoykost' stali stal'n. konstruktsiy, Novosibirsk, Nauka Press, 1971, pp 71-86

The author considers it expedient to estimate the temperature reserve of viscosity of the material by the absolute magnitude of the difference between the operating temperature T_0 and the critical brittleness temperature T_{cr}. From a brief investigation of the basic factors characterizing the possibility of brittle fracture of welded structural elements, the author draws the conclusion that two factors are actually determining: the temperature reserve of viscosity and the level of the rated stresses. It is reported that the rupture stress for which the brittle crack spreads over the entire cross section of the test piece depends on the temperature. The magnitude of the rupture stresses turned out to be below the yield point. An analysis of the results of studies by a number of authors is presented, and it is demonstrated that these data can be used as the basis for calculating the strength of the welded structural elements which operate at reduced temperatures. On the basis of investigating certain cases of emergencies of large structural elements and machine parts, the author arrives at the conclusion that $\Delta T = T_0 - T_{cr} < -10°$ is the condition of brittle fracture of the welded structural element, and $\Delta T > 10-30°$ is the condition of safe operation of the welded structural element (depending on the average stress

3/4

USSR

RAZOV, I. A., Khladostoykost' stali stal'n. konstruktsiy, Novosibirsk, Nauka Press, 1971, pp 71-86

level). It is confirmed that inhibition of brittle cracks and, consequently, absence of catostrophic brittle fractures are insured within the limits of $10° > \Delta T > -10°$, and when $\Delta T > 0°$ fracture under stress concentration conditions and the effect of residual stresses take place only for stresses on the order of the yield point. The bibliography has 16 entries.

4/4

1/2 044 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--MECHANICAL PROPERTIES OF KH18N10T STEEL AFTER NEUTRON IRRADIATION, AND THEIR RECOVERY DURING ANNEALING -U-

AUTHOR--LAPIN, A.N., NIKOLAYEV, V.A., RAZOV, I.A.

COUNTRY OF INFO--USSR

SOURCE--FIZ. KHIM. OBRAB. MATER. 1970, (1) 8-13

DATE PUBLISHED-------70

SUBJECT AREAS--NUCLEAR SCIENCE AND TECHNOLOGY, MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--MECHANICAL PROPERTY, STAINLESS STEEL, ANNEALING, METAL CREEP, DEFORMATION RATE, NEUTRON IRRADIATION, ALLOY DESIGNATION/(U)KH18N10T STAINLESS STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0644 STEP NO--UR/0472/70/000/001/0008/0013

CIRC ACCESSION NO--AP0105623

UNCLASSIFIED

2/2 044 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0105623

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MICROSPECIMENS (DIAM. 1, LENGTH 5 MM) FROM STEEL KH18N10T (C 0.07, SI 0.52, MN 1.14, CR 18.0, NI 10.8, AND TI 0.53 WT. PERCENT) WERE TESTED FOR TENSILE STRENGTH AT DEFORMATION RATE 0.02-SEC BEFORE AND AFTER IRRADN. IN WORKING CHANNELS OF AN ACTIVE ZONE OF THE REACTOR RFT. THE RATIO OF FAST (IS GREATER THAN OR EQUAL TO 1 MEV) TO THERMAL NEUTRONS WAS 0.71 PLUS OR MINUS 0.12. THE EFFECT OF DOSE WAS DETD. AT 100-30DEGREES, WITHIN THE RANGE 10 PRIME19 TO 10 PRIME21 NEUTRONS-CM PRIME2. HOWEVER, OTHER PROPERTIES CHANGE WITHIN THIS RANGE; E.G. TENSILE STRENGTH DECREASED, WHILE RELATIVE ELONGATION INCREASED. THIS INDICATES THAT DOSES IS GREATER THAN 10 PRIME30 NEUTRONS-CM PRIME2 DID NOT CAUSE A TRUE SATN. STATE. THE EFFECT OF TEMP. WAS STUDIED AT 100-550DEGREES WITH DOSES 4 TIMES 10 PRIME20, 2 TIMES 10 PRIME20, 3.5 TIMES 10 PRIME20, AND 3.5 TIMES 10 PRIME20; EACH DOSE AT FOLLOWING TEMPS. 200-20, 250-300, 350-400, AND 550DEGREES, RESP. STUDIED STEEL REACHED MAX. STRENGTH AFTER IRRADN. AT 200-20DEGREES. THE SOFTENING (WEAKENING) EFFECT OF IRRADN. DECREASED AT TEMPS. IS GREATER THAN 300DEGREES AND AT 500DEGREES THERE WAS PRACTICALLY NO CHANGE IN STRENGTH OF THE STEEL. A PLATFORM OF CREEP WAS FORMED DURING THE INITIAL STAGES OF PLASTIC FLOW AND THIS INDICATES THAT SOME MECHANISM FACILITATING SLIP IS PRESENT DURING THESE STAGES.

UNCLASSIFIED

R

UDC 539.3.019.3:669.15--194.56

USSR

LAPIN, A. N., NIKOLAYEV, V. A., RAZOV, I. A., Leningrad

"Mechanical Properties of Kh18N10T Steels Following Neutron Irradiation; Their Reduction During Annealing"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 1, Jan-Feb 70, pp 8-13

Abstract: Radiation damage in metals is known to be directly proportional to the size of the integral dose, and inversely proportional to the irradiation temperature; this can be used as a basis for further study of the mechanisms of radiation damage. The authors studied shifts in the mechanical properties of Kh18N10T steels following an integral neutron dose of $E_n >$ 1 Mev (difference in σ—0.2; form of the tensile diagram, reduced strain hardening with increase in dose). These shifts are explained on the basis of the interaction between moving dislocations and complex radiation defects, and on the basis of differences in concentration and in the spectrum of the complex defects.

1/1

1/2 010 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--MEASUREMENT OF THE LIFETIMES OF GADOLINIUM 151 EXCITED STATES -U-

AUTHOR-(03)-MOROZOV, V.A., MUMINOV, T.M., RAZOV, V.I.

COUNTRY OF INFO--USSR

SOURCE--YAD. FIZ. 1970, 11(5), 921-4

DATE PUBLISHED-------70

SUBJECT AREAS--NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--GADOLINIUM ISOTOPE, HALF LIFE

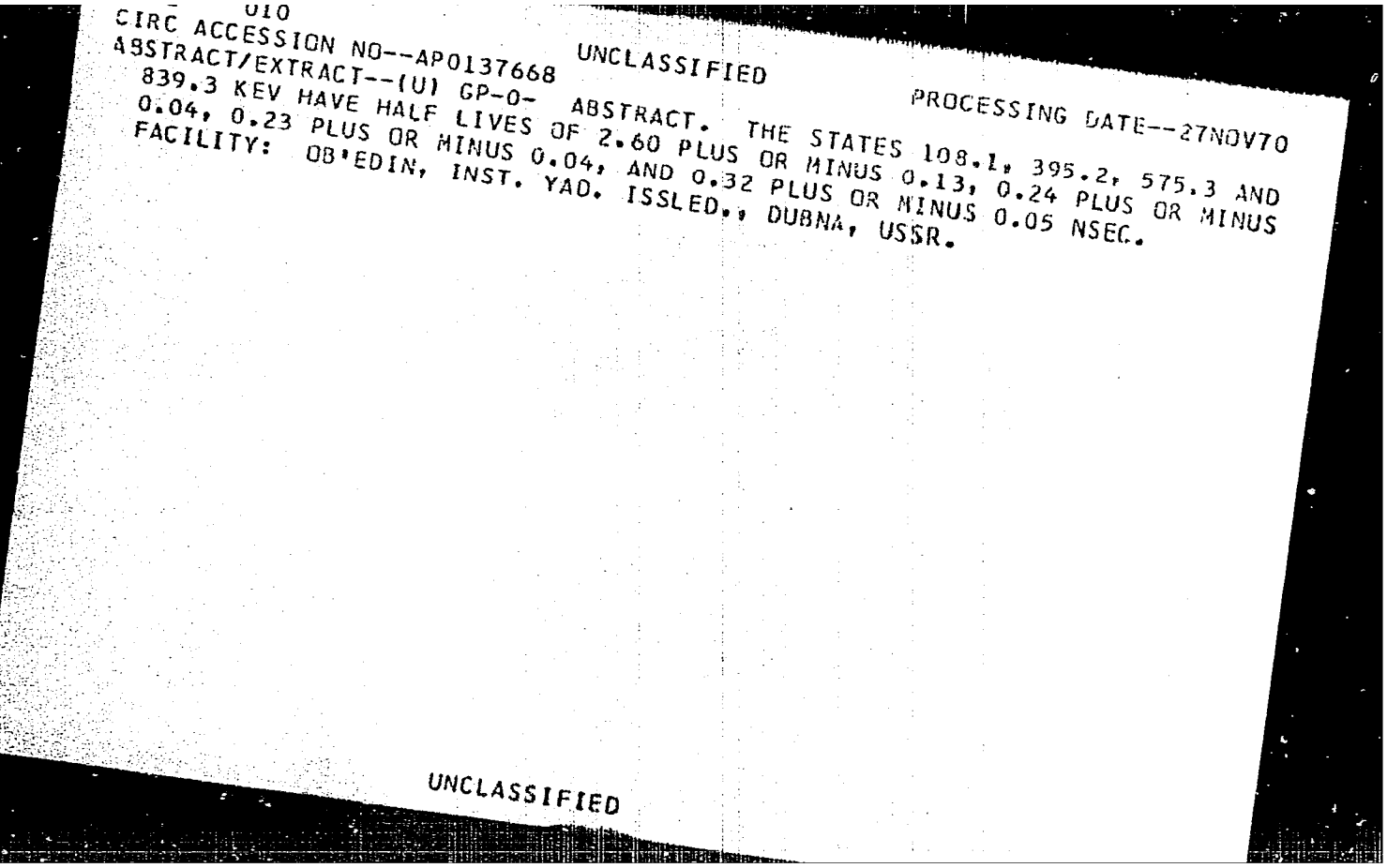
CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/0583 STEP NO--UR/0367/70/011/005/0921/0924

CIRC ACCESSION NO--AP0137668

UNCLASSIFIED



U10

CIRC ACCESSION NO--AP0137668 UNCLASSIFIED

PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE STATES 108.1, 395.2, 575.3 AND 839.3 KEV HAVE HALF LIVES OF 2.60 PLUS OR MINUS 0.13, 0.24 PLUS OR MINUS 0.04, 0.23 PLUS OR MINUS 0.04, AND 0.32 PLUS OR MINUS 0.05 NSEC.

FACILITY: OB'EDIN, INST. YAD. ISSLED., DUBNA, USSR.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--HYDROLYSIS OF PHOSPHONOUS AND PHOSPHINOUS ACID ESTERS CONTAINING A PHOSPHORUS HYDROGEN BOND -U-

AUTHOR-(04)-BELSKIY, V.YE., MOTYGULLIN, G.Z., YELISEYENKOV, V.N., RAZPOLOZHENSKIY, N.I.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (3), 565-8

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--HYDROLYSIS, ORGANIC PHOSPHORUS COMPOUND, ESTER, CHEMICAL BONDING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0905 STEP NO--UR/0062/70/000/003/0565/0568

CIRC ACCESSICN NO--AP0124566
UNCLASSIFIED

2/2 019 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124566

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FOLLOWING ETP(O)(OR)H, PREPD. CONVENTIONALLY, WERE USED (R SHOWN): MEETCH, B SUB12 80-1DEGREES, D PRIME20 0.9865, N PRIME20 SUBD 1.4274; CL CH SUB2 CH SUB2, B SUB0.2 65-6DEGREES, 1.2183, 1.4578; AND ME SUB3C, B SUB0.1 35DEGREES 0.9977, 1.4328. THE LAST WAS RATHER UNSTABLE AND DECOMPD. ON STORAGE, EVEN IN A SEALED BULB, WITH LOSS OF ME SUB2C:CH SUB2. THE FOLLOWING VALUES OF AQ. HYDROLYSIS RATE CONSTS. (K TIMES 10 PRIME6 SEC PRIME1 NEGATIVE) (AT 98, 90, 80, AND 70DEGREES, RESP.), ACTIVATION ENERGY (KCAL-MOLE) AND DELTA S PRIME PLUS OR MINUS (E.U.) WERE REPORTED, RESP., FOR. SHOWN ON MICROFICHE. RATE CONSTS. FOR ALK. HYDROLYSIS FOR THE TERT BU ESTER WERE: (K NA 1 MOLE SEC.) ODEGREES 0.045, 10DEGREES, 0.102, 20DEGREES 0.19, 30DEGREES 0.35, ACTIVATION ENERGY 11.2 AND DELTA S 25 E.U. ALTHOUGH GENERALLY THE AQ. HYDROLYSIS RATE CONSTS. DECREASED WITH INCREASING CHAIN LENGTH AND BRANCHING, THE ESTERS WITH MEETCH AND ME SUB3 C GROUPS WERE GREATLY REACTIVE, OWING TO AN SN 1 MECHANISTIC CHANGE IN THE MECHANISM AT THE C ATOM OF THE ALC. GROUP. FOR OTHER ESTERS CLEAVAGE AT THE P O LINK IS LIKELY, AS IN DIALKYL PHOSPHITES.

FACILITY: INST. ORG. FIZ. KHIM. IM. ARBUZOVA, KAZAN, USSR.

UNCLASSIFIED

USSR

RAZSUDOV, V. N.

"The Methemoglobin-Forming Properties of Methylnitrophos"

Moscow, Voprosy Mediko-Biologicheskikh Issledovaniy. Materialy Konferentsii Molodykh Nauchnykh Rabotnikov Mediko-Biologicheskogo Fakul-teta (Aspects of Biomedical Research. Materials of a Conference of Young Scientific Workers of the Biomedical Faculty), Ministerstvo Zdravookhraneniya SSSR, 1970, 93 pp, pp 85-86

Abstract: White rats were used in experiments conducted to determine the methemoglobin-forming properties of methylnitrophos, an organophosphorus nitrogen compound widely used in agriculture. Methylnitrophos was administered intraperitoneally to the animals in a lethal dose -- 90 mg/kg. Within 1, 4, and 24 hours after administration of the chemical, investigations were conducted to determine the blood content of methemoglobin. It was established that within 1 and 4 hours after the administration

1/2

USSR

RAZSUDOV, V. N.

"The Use of Cholinesterase Reactivators for the Experimental Treatment of Methylnitrophos (New Organophosphorus Insecticide) Poisoning"

[Tr.] Tsentr. in-ta usoversh. vrachey (Works of Central Institute for the Advanced Training of Physicians), 1970, 143, pp 121-125 (from RZh-Farmakologiya, Khimioterapevticheskiye Sredstva, Toksikologiya, No 4, Apr 71, Abstract No 4.54.711 by N. M. SEDOV)

Translation: LD_{50} of methylnitrophos (dimethyl 4-nitro-3-methylphenyl thiophosphate) administered once intragastrically was 186 mg/kg for mice, 138 for rats. The clinical picture of methylnitrophos poisoning was characterized by salivation, lacrimation through the nose, tremor, clonic and tonic spasms, and muscular fibrillations (excitation of organism's cholinoresponsive systems). Animals' death from respiratory paralysis ensued. Employment of cholinesterase reactivators (2-PAM chloride and TMB-4) in doses of 2-75 mg/kg intraperitoneally showed their antidotal activity relative to methylnitrophos. The addition of atropine (1 mg/kg) to cholinesterase reactivators raised their effectiveness.

1/1

USSR

UDC: 654.9-525

KOZ[illegible]RODOV, V. A., IVAN[illegible], A. A., RAZUMENKO, Y. N., [illegible], V. G., Ust'-Kamenogorsk Instrument Plant

"A Pneumatic Analyzer of Limiting Deviations"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 31, 1970, Soviet Patent No 283682, Class 42, filed 30 May 69, p 137

Abstract: This Author's Certificate introduces a pneumatic analyzer of limiting deviations. The device contains AND logic elements which act as data units for the deviational standards; deviation signal devices; and a group analog-code converter which includes a series circuit made up of a pulse oscillator, pulse counter, code-analog converter, and comparison elements equal in number to the variables being converted. As a distinguishing feature of the patent, the device is simplified and precision is improved by connecting two AND elements by their inputs to the outputs of the pulse counter in the group analog-code converter, the outputs of these AND elements being connected to the upper and lower deviation signal devices, the first output being connected through an inhibit element and a flip-flop with separate inputs, and the second through a third AND element and another flip-flop with separate inputs. The output of the comparison element in the group analog-code converter is connected to the inputs of the inhibit element and the third AND element.

1/1

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202620014-2"

USSR

UDC (539.551+531.424):(546.24+546.683-143)

ANDRIANOVA, T. N., ALEKSANDROZ, A. A., OKHOMIN, V. S., RAZUMEYCHENKO, L. A., PANINA, Z. I.

"Viscosity and Density of Melts in the Thallium-Tellurium System"

Teplofizika Vysokikh Temperatur, Vol 9, No 5, 1971, pp 934-937.

Abstract: Results are presented from studies of the viscosity and density of melts in the thallium-tellurium system in the concentration interval from 32 at.% Te to 100% Te and in the temperature interval from the melting point to 1,300°K. Analysis of the isotherms of the properties studied shows the existence in the liquid phase of the stable compound Tl_2Te, which does not dissociate over a broad temperature range. An analysis is presented of structural changes in melts of the concentrations studied.

1/1

USSR UDC 621.362.2

ANDRIANOVA, T. N., ALEKSANDROV, A. A., OKHOTIN, V. S., PANINA, Z. I., RAZUMEYCHENKO, L. A.

"Investigation of Semiconductor Systems Based on Sb_2Se_3 in the Molten State"

Tr. Mosk. energ. in-ta (Works of the Moscow Power Engineering Institute), 1970, vyp. 75, pp 192-196 (from RZh-Elektrotekhnika i Energetika, No 1, Jan 71, Abstract No 1A159)

Translation: An investigation is made of the effect of various elements on the structure of antimony selenide in the molten state. The kinematic viscosity and density of melts of Sb, Se, Zn, Cu, Ga, In, Te and Sn in antimony selenide were measured. The change in structure of melts of 80 at.% Sb_2Se_3 + 20 at.% Ga and 80 at.% Sb_2Se_3 + 20 at.% Sn takes place over a narrow temperature interval of $\Delta t \approx 50°K$, while the structure of a melt of 80 at.% Sb_2Se_3 + 20 at.% In varies continuously over the entire temperature interval from 950 to 1300°K. Two illustrations, bibliography of two titles. A. Kh. Cherkasskiy.

1/1

1/2 039 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--THEORETICAL AND EXPERIMENTAL PROBLEMS IN THE STUDY OF THE MECHANISMS OF THE VESTIBULAR NYSTAGMUS -U-

AUTHOR-(04)-RAZUMEYEV, A.N., SRAGOVICH, V.G., SUSHKOV, B.G., SHIPOV, A.A.

COUNTRY OF INFO--USSR

SOURCE--KOSMICHESKAIA BIOLOGIIA I MEDITSINA, VOL. 4, JAN.-FEB. 1970, P. 22-30

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--SPACE MEDICINE, VESTIBULAR DISTURBANCE, EYE, VISUAL PERCEPTION, SENSORY PHYSIOLOGY, MATHEMATIC MODEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/1969 STEP NO--UR/0453/70/004/000/0022/0030

CIRC ACCESSION NO--AP0120612

UNCLASSIFIED

2/2 039 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0120612

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REVIEW OF PUBLISHED STUDIES CONCERNING THE MECHANISMS OF THE VESTIBULAR NYSTAGMUS. A MATHEMATICAL MODEL OF THE INTERACTION BETWEEN THE VESTIBULAR AND OCULOMOTOR APPARATUSES IS PROPOSED AS THE BASIS OF A POSSIBLE MECHANISM OF THE DEVELOPMENT OF A VESTIBULAR NYSTAGMUS. THE ANATOMICAL AND PHYSIOLOGICAL CORRELATIONS BETWEEN THE COMPONENTS OF THIS MODEL DURING THE PROCESSING OF AFFERENT INFORMATION ARE DISCUSSED. EXPERIMENTS DESIGNED TO BRING THIS MODEL CLOSER TO THE CEREBRAL STRUCTURES RESPONSIBLE FOR THE NYSTAGMUS ARE DESCRIBED.

UNCLASSIFIED

1/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--CONCERNING CERTAIN PROBLEM OF SERVICE -U-

AUTHOR--RAZUMIKHIN, B.S.

R

COUNTRY OF INFO--USSR

SOURCE--AVTOMATIKA I TELEMEKHANIKA, 1970, NR 4, PP 116-120

DATE PUBLISHED--------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--INFORMATION STORAGE AND RETRIEVAL, INFORMATION CENTER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1999/0417 STEP NO--UR/0103/70/000/004/0116/0120

CIRC ACCESSION NO--AP0122597

UNCLASSIFIED

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202620014-2"

2/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0122597

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERE IS GIVEN THE STATEMENT AND THE SOLUTION OF THE PROBLEM OF THE MINIMUM OF THE CAPACITY OF THE STATIONS SERVING A MULTICOMPONENT STREAM OF CLIENTS.

UNCLASSIFIED

USSR

UDC 681.327

[redacted], BALANDIN, G. P., PAL'CHINSKIY, V. F.

"Device for Controlling the Power Supply and for the Control of a Digital Computer"

Patent No. 327483 (1327286/18-24 from 5 May 1969), Class G 06f 15/46, G 01r 31/28, announced by the Institute of Mining Mechanics and Technical Cybernetics imeni M. M. Fedorov (from Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No. 5, 1972, p 141)

Abstract: A device for the control of the power supply, memory capacitors, and the circuit for controlling emergency operations and automatic starting of a computer and a coincidence circuit are described; they are distinguished by the fact that in order to raise control reliability the memory capacitors in it are connected with the input circuits for observing the loss of power. The outputs of these circuits are connected to the inputs of the coincidence circuits, and the output of the coincidence circuit is connected with the circuits for controlling emergency operations and automatic startup of the computer.

1/1

USSR

UDC: 517.9

RAZUMEYKO, R. V., Moscow State University imeni M. V. Lomonosov

"Evaluating the Error of Numerical Integration of a Quasilinear First-Order Equation"

Moscow, Matematicheskiye Zametki, Vol 13, No 2, Feb 73, pp 207-215

Abstract: The method of finite differences is used to obtain an approximate solution of the Cauchy problem for the equation

$$u_t + (\varphi(u))_x = 0,\ u^0|_{t=0} = u^0(x),\ \varphi''(u) \geq 0$$

where $u^0(x)$ is an arbitrary, bounded, measurable function, $u_2 \leq u^0(x) \leq u_1$. It is shown that the solution of difference equation

$$l_1(u_{n,m}) \equiv \frac{u_{n+1,m} - u_{n,m}}{\tau} + \frac{\varphi(u_{n,m}) - \varphi(u_{n,m-1})}{h} = 0$$

converges weakly to the solution of this quasilinear equation of order $O(h^{\frac{1}{2}})$.

1/1

USSR UDC 621.357.5.035:621.70.027(088.8)

PETROV, A. I., and RAZUMIKHIN, G. M.

"Device for Protection Against Short Circuiting During the Electrochemical Treatment of Metals"

Author's Certificate No 347144, filed 4 Dec 70, published 21 Aug 72 (from Referativnyy Zhurnal -- Khimiya, No 8(II), 1973, Abstract No 8L289P)

Translation: A device is patented for protection against short circuiting during the electrochemical milling of metals using a circuit for the control of the power supply by silicon resistors. It is improved in that in order to increase the reliability and the simplicity of the instrument it operates as a pick up for spark formation, the input of which is connected to the electrochemical gap and the output to a switch conducting the signal to the multivibrator, switching off and on the corresponding silicon resistors in the power supply.

1/1

USSR

BOLYCHEVTSEV, A. D., DOBRYDEN', V. A. and RAZUMNYY, V. T.

"The Protection of an Object Servicing a Stable Random Stream"

Pribory i Sistemy Avtomatiki. Resp. Mezhved. Temat. Nauch.-Tekhn. Sb. [Automation Devices and Systems. Republic Interdepartmental Thematic Scientific and Technical Collections], 1973, No 27, pp 62-67 (Translated from Referativnyy Zhurnal Kibernetika, No 10, 1973, Abstract No 10V269)

Translation: The problem of optimization of an algorithm for protection of a single-line queueing system without waiting and with zero servicing time from failures when the input stream is stationary is studied. A condition is produced, establishing the boundary of economic expediency of introduction of protection. An algorithm is constructed which is otimal with respect to the criterion of mean specific expenditures. It is a threshold-type algorithm. Author's view

1/1

USSR

UDC 547.241 + 546.185.131

MOSKVA, V. V., ISMAILOV, V. M., NOVRUZOV, S. A., RAZUMOV, A. I., ZYKOVA, T. V., AKHMEDOV, Sh. T., and SALAKHUTDINOV, R. A., Kazan' Chemical Technological Institute imeni S. M. Kirov and Azerbaydzhan State University imeni S. M. Kirov

"Phosphorylation of α,α-Dichlorodiethyl Ether With Phosphorus Pentachloride"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 9, Sep 73, pp 2085-2086

Abstract: The reaction of α,α-dichlorodiethyl ether with PCl_5 leads to the formation of a complex which upon decomposition yields dichlorophosphoneacetic acid trichloride, and β-chloro-β-ethoxyvinylphosphonic acid dichloride in two geometric isomers.

1/1

USSR

UDC 547.241 + 547.281.2 + 547.422

RAZUMOV, A. I., MAYKOVA, A. I., and MOSKVA, V. V., Kazan' Chemical-Technological Institute imeni S. M. Korov, and Chuvash State University imeni I. N. Ul'yanov

"Reaction of Diethylchlorophosphine With Cyclic Acetals"

Ivanovo, Khimiya i Khimicheskaya Tekhnologiya, Vol 16, No 10, 1973, pp 1600-1602

Abstract: Cyclic acetals react in a more complex manner with P(III) acid chlorides than the open acetals. This is due to the fact that a ring may be opened at various positions of unsymmetric acetals and because of the various ways in which the intermediate product may react: intra and intermolecular Arbuzov reaction is possible.

1/1

USSR

UDC 241.+ 547.26.118 + 547.281

RAZUMOV, A. I., LIORBER, B. G., MOSKVA, V. V., and SOKOLOV, M. P., Kazan' Chemical Technological Institute imeni S. M. Kirov

"Phosphorylated Aldehydes"

Moscow, Uspekhi Khimii, Vol 42, No 7, Jul 73, pp 1199-1224

Abstract: A review with 120 references reporting systematically analyzed data on the synthetic methods and chemical properties of phosphorylated aldehydes. Principal attention has been given to the analysis of the organophosphorus compounds containing a formyl group in the alkyl radical connected with the phosphorus atom by a C-P bond. The aldol-enol tautomerism of the phosphorylated aldehydes is discussed in detail, the effect of various factors on the position of aldo-enol equilibrium having been analyzed. The geometric structure of the enols formed is reported.

1/1

USSR

UDC 547.26'118 + 546.183-31

GAZIZOV, M. B., RAZUMOV, A. I., SYRNEVA, L. P., and RUDAKOVA, L. G.,
Kazan' Chemical-Technological Institute imeni S. M. Kirov

"Reaction of Phosphorylated Acetals With Trivalent Phosphorus Chlorides"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 12, Dec 73, p 2787

Abstract: Phosphorylated acetals react with diethylchlorophosphite after 8 hrs heating at 50-60° yielding diethylphosphorous acid and esters of β-ethoxyvinylphosphonic or phosphinic acids — $R(C_2H_5O)P(O)CH{:}CHOC_2H_5$; R, yield in %, b.p./mm pressure, d_4^{20}, and n_D^{20} being reported: C_2H_5O, 74.2, 75°/0.12, 1.0700, 1.4435; CH_3, 65.7, 80/0.25, 1.0524, 1.4570; C_2H_5, 77.5, 74°/0.09, 1.0367, 1.4560.

1/1

USSR

UDC 547.26'118 + 547.292.6

GAZIZOV, M. B., SULTANOVA, D. B., RAZUMOV, A. I., OSTANINA, L. P., ZYKOVA, T. V., and SALAKHUTDINOV, R. A., Kazan' Chemical-Technological Institute imeni S. M. Kirov

"Reaction of Trivalent Phosphorus Trichloride With Acetic Anhydride"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 10, Oct 73, pp 2160-2165

Abstract: Experimental data are reported of the reaction of alkyldichlorophosphites, aryl- and ethyldichlorophosphines (I) with acetic anhydride (II). The same reactions were also studied in presence of α-chloroesters (III). Reaction products were studied by means of IR and NMR spectroscopy, by chemical methods and thin layer chromatography. On the basis of NMR ^{31}P it has been shown that in the reaction of (I) with (II) a gradual substitution of chlorine atoms by acetoxy groups takes place in compound (I). A synthetic method has been developed for the chloroanhydrides and anhydrides of α-alkoxyethylphosphonic and phosphinic acids directly from the derivatives of the phosphorous and phosphinous acids.

1/1

USSR

UDC 547.26'118 + 546.185.131

GAZIZOV, M. B., SULTANOVA, D. B., RAZUMOV, A. I., and TREGUBOVA, T. V., Kazan' Chemical Technological Institute imeni S. M. Kirov

"Reaction of Neutral Esters of α-Alkoxyethylphosphonic Acids With Phosphorus Pentachloride"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 9, Sep 73, p 2087

Abstract: The reaction of neutral esters of α-alkoxyethylphosphonic acid with PCl_5, taking the reagents at the ratio of 1:3, at 40° for 15 hrs, yields α-alkoxyvinylphosphonic acid chlorides (I) and alkyldichlorophosphates (II), in addition to phosphorus oxychloride, hydrogen chloride and alkyl halides: R' or R, the yield in %, b.p.°/mm Hg, d_4^{20}, n_D^{20} for (I) for (I) are being reported: C_2H_5, 74.0, 63/0.03, 1.3269, 1.4910; C_4H_9, 66.7, 85/0.07, 1.2334, 1.4870; and for (II): C_2H_5, 17.0, 81/43, 1.3823, 1.4340; C_3H_7, 32.8, 67/10, 1.3082, 1.4380.

1/1

USSR

UDC 547.26.118+547.341

ISMAILOV, V. M., MOSKVA, V. V., BABAYEVA, T. A., AKHMEDOV, SH. T. and RAZUMOV, A. I., Kazan Institute of Chemical Technology imeni Kirov, and Azerbaydzhan State University imeni Kirov

"Mixed Esters and Ester Chloroanhydrides of β-Alkoxyvinylphosphonic and -Thiophosphonic Acids"

Baku, Azerbaydzhanskiy Khimicheskiy Zhurnal, No 4, 1972, pp 47-49

Abstract: Mixed dialkyl and alkylaryl esters of β-alkoxyvinylphosphonic acids were synthesized by reacting ester chloroanhydrides with alcohols (1 mole) or phenol at 0-5°C under a current of dry CO_2 in the absence of HCl acceptor. Treatment of the mixed dialkyl esters with PCl_5 yielded the corresponding chloroanhydrides by substitution of Cl for the different alkoxy groups. Conditions were determined for the substitution of Cl atoms for the alkoxy groups (2 on the P atom and 1 on the C atom) by reacting diethyl- β-ethoxyvinylphosphonate with PCl_5 in CCl_4. At 40-50°C one of the alkoxy groups on the P atom is replaced by Cl giving the appropriate ester chloroanhydride. Reaction of the

1/2

(1)

USSR

ISMAILOV, V. M., et al., Azerbaydzhanskiy Zhurnal, No 4, 1972, pp 47-49

latter with an additional portion of PCl_5 at 70-80°C results in the corresponding ester chloroanhydride of α-chloro-β-ethoxyvinylphosphonic acid, in which treatment with excess alcohol in the cold replaces one of the Cl atoms on the P atom with an alkoxy group, and on further reaction with PCl_5 at 110°C yields the dichloroanhydride of α-chloro-β-ethoxyvinylphosphonic acid. The above approach may be utilized to replace 2 or 3 of the alkoxy groups with Cl. The resultant chloroanhydrides are readily distilled liquids with a characteristic odor, and are stable on long-term storage in the cold.

2/2

USSR

UDC 547.341 + 546.185'131

ISMAILOV, V. M., ZYKOVA, T. V., MOSKVA, V. V., NOVRUZOV, S. A., RAZUMOV, A. I., AKHMEDOV, SH. T., and SALAKHUTDINOV, R. A., Kazan' Chemical-Technological Institute Imeni S. M. Kirov, and Azerbaydzhan State University Imeni S. M. Kirov

"Derivatives of Substituted Vinylphosphonic Acids. XVI. Schematic for the Phosphorylation of Alkylacetates With Phosphorus Pentachloride"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 6, Jun 73, pp 1247-1250

Abstract: Reactions of phosphorus pentachloride with ethylacetate have been investigated using different reagent ratios. It has been established that the reaction products consist of β-chloro-β-ethoxyvinylphosphonic acid dichlorides and phosphonodichloroacetic acid trichlorides. The first step in this reaction is the replacement of the carbonyl oxygen atom with two chlorine atoms yielding α,α-dichloroethylalkyl ether, which upon dehydrochlorination yields α-chlorovinylalkyl ether. The latter reacts with PCl_5 yielding the final products. On the basis of NMR data, it has been shown that the β-chloro-β-ethoxyvinylphosphonic acid dichloride forms in two geometric isomers.

1/1

USSR

UDC 547.241

MUKHACHEVA, O. A., NIKOLAYEVA, V. G., SHCHELKUNOVA, M. A., and RAZUMOV, A. I.,
Kazan' Chemical Technological Institute Imeni S. M. Kirov

"Studies in the Series of Phosphinic and Phosphinous Acid Derivatives. XCI. O-Alkyl- and O-Acyl- Derivatives of the Phosphorylated Hydroxamic Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 6, Jun 73, pp 1240-1247

Abstract: Alkylation and acylation of the potassium salts of dialkyl (diacyl) phosphinylhydroxamic acids yields O-alkyl or O-acyl derivatives of the mother compounds. The structure of the compounds obtained was supported by IR spectral data. Possible reaction mechanisms have been discussed. A series of potassium, silver, cobalt, nickel, and copper salts of O-acyl derivatives of the phosphorylated hydroxamic acids has been synthesized.

1/1

USSR

UDC 547.26'118+547.29'26

GAZIZOV, M. B., RAZUMOV, A. I., and SEKERIN, YE. A., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Reaction of Diethoxymethyl Ester of Acetic Acid With Dialkylchlorophosphites"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 6, Jun 73, p 1407

Abstract: Reaction of diethyl- and dipropylchlorophosphites with diethoxymethyl acetate occurs smoothly already at room temperature. For completion it is necessary to heat the mixture for 3 hrs to 50°C. The products of this reaction are phosphorylated formals and α-ketophosphonic esters of the type $(RO)_2P(O)CH(OC_2H_5)_2$ and $(RO)_2P(O)C(O)CH_3$ respectively.

1/1

USSR

UDC 547.241+546.185'131

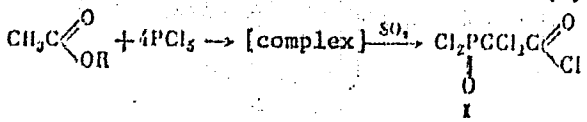
(3)

ISMAILOV, V. M., MOSKVA, V. V., NOVRUZOV, S. A., RAZUMOV, A. I., AKHMEDOV, SH. T., ZYKOVA, T. V., and SALAKHUTDINOV, R. A.

"Interaction of Phosphorus Pentachloride with Alkyl Acetates"

Leningrad, Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, p 212

Abstract: Under mild conditions (neutral solvent, 15-20°), the interaction of phosphorus pentachloride with alkyl acetates takes place with the formation of phosphorylation products, the nature of which depends on the reagent ratio. With a quadruple excess of phosphorus pentachloride, depending on the alkyl radical in the initial esters (R = Me, Et), the basic product can be the trichloranhydride of chlorophosphonacetic acid (I)



With smaller amounts of phosphorus pentachloride, more complex mixtures of products of phosphorylation are formed in which the proportion of the pro-

1/2

USSR

(3)

ISMAILOV, V. M., et al., Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, p 212

duct (I) decreases with a decrease in the phosphorus pentachloride taken. This indicates that product (I) is the final product of the presented interaction. The experimental procedure for obtaining the product and infrared and other data confirming its structure are presented.

2/2

USSR

UDC 547.298.6

ISMAGILOV, R. K., YAFAROVA, R. L., and RAZUMOV, A. I.

"Reaction of Ethyl Chloroformate with Potassium Derivatives of Diphenylphosphonylacetic Ester"

Leningrad, Zhurnal Obshchey Khimii, Vol 42 (104), No 9, Sep 72, p 2113

Abstract: The potassium derivative obtained from ethyl ester of diphenylphosphonylacetic acid and ethylchloroformate was stirred for 3 hrs at 50-60° in toluene producing $(C_6H_5)_2P(O)CK(COOC_2H_5)_2$, which upon acidification with 5% HCl yielded $(C_6H_5)_2P(O)CH(COOC_2H_5)_2$, m. p. 119-121°. Removing toluene from the residue followed by extraction with hexane-ether precipitated $(C_6H_5)_2P(O)CH_2COOC_2H_5$, m. p. 74-76°. Evaporation of the solvent yielded $(C_6H_5)_2P(O)OC_2H_5$, b. p. 145-150° (0.1 mm). The residue from the extraction represented tarry product $(C_6H_5)_2P(O)CH_2C(O)CHKCOOC_2H_5$.

1/1

USSR

UDC 547.26'118 + 547.292.6

GAZIZOV, M. B., SULTANOVA, D. B., RAZUMOV, A. I., YELNIKOVA, G. N., and OSTANINA, L. P., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Reaction of Aryldichlorophosphines With Acetic Acid Acylals"

Leningrad, Zhurnal Obshchey Khimii, Vol 42 (104), No 9, Sep 72, pp 2112-2113

Abstract: Aryldichlorophosphines react with equimolar quantities of acetic acid acylals at 50° yielding α-alkoxyethylarylphosphinic acid chlorides. The yields of these products can be improved by using excess chlorophosphine or running the reaction in presence of an equimolar quantity of α-chloroether.

1/1

USSR

UDC 547.241

NIKOLAYEVA, V. G., ANISIMOVA, L. V., MUKHACHEVA, O. A., and RAZUMOV, A. I., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Studies in the Series of Phosphinic and Phosphinous Acid Derivatives LXXXIX. Structures and Properties of Phosphorylated Hydroxamic Acids and Their Salts"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 5, May 73, pp 1013-1019

Abstract: A series of phosphorylated hydroxamic acids and salts was synthesized by a previously described method. Physical constants, IR, UV, and PMR data are reported for the new compounds. On the basis of spectral analysis it was shown that the solid phosphorylated hydroxamic acids and their salts are in the amide form $R_2P(=O)(CHX)_nC(=O)NHOH$.

1/1

USSR

UDC 547.341

RAZUMOV, A. I., SOKOLOV, M. P., LIORBER, B. G., MOSKVA, V. V., SAZONOVA, Z. YA., and LOGINOVA, N. G., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Synthesis and Properties of Phosphorylated Imines and Enamines"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 5, May 73, pp 1019-1026

Abstract: Several methods exist for the synthesis of phosphorylated secondary and tertiary enamines and imines: direct reaction of primary amines with aldehydes, reaction of secondary enamines with phosphorylated aldehydes in presence of p-toluenesulfonic acid, reaction of the diamides of allylphosphorous acid with aldehydes, and transamination of enamines. Imine-enamine tautomerism of these products was studied showing that the position of tautomeric equilibrium depends principally on the nature of substituents at the nitrogen atom and on the type of solvent used. Hydrogen bonding of the enamine forms depends mainly on the substituents at nitrogen and phosphorus atoms and on the steric distribution of proton acceptors.

1/1

USSR

UDC 547.341

ZYKOVA, T. V., MOSKVA, V. V., RAZUMOV, A. I., NAZVANOVA, G. F., and SALAKHUTDINOV, R. A., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Derivatives of Substituted Vinylphosphonic Acids. XIV. Study of the Derivatives of Substituted Vinylphosphonic Acids by the NMR-spectroscopic Methods"

Leningrad, Zhurnal Obshchey Khimii, Vol 42 (104), No 9, Sep 72, pp 1913-1916

Abstract: Compounds of the type $RR'P(O)C(X) = CHOC_2H_5$ were studied by high resolution NMR ^{31}P and ^{1}H method. The effects of individual atoms have been discussed and the geometric structures of the investigated compounds have been determined. In general, changes in chemical shifts of the phosphorus atom of various derivatives of vinylphosphonic acids are identical to the shifts observed with alkylphosphonic acids. The derivatives of β-alkoxyvinylphosphonic acids have the alkoxy group always in trans position with respect to the phosphorus atom.

1/1

USSR UDC 547.26'118 + 546.185'131

MOSKVA, V. V., BASHIROVA, L. A., RAZUMOV, A. I., ZYKOVA, T. V., and SALAKHUTDINOV, R. A., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Reaction of Phosphorus Pentachloride With Aldehydes"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 3, Mar 73, pp 677-678

Abstract: It has been shown that a prolonged mixing (5 days) of the acetaldehyde with phosphorus pentachloride in benzene solution at room temperature yields α-chloroalkylphosphoric acid dichloride, b.p. 53°/12 mm, d_4^{20} 1.4810, n_D^{20} 1.4570. Using chloral in an analogous reaction gives the dichloroanhydride of α,β,β,β-tetrachloroethylphosphonic acid, b.p. 107°/12 mm, d_4^{20} 1.7730, n_D^{20} 1.5006.

1/1

USSR UDC 547.241

RAZUMOV, A. I., LIORBER, B. G., SOKOLOV, M. P., MOSKVA, V. V., NAZVANOVA, G. F., ZYKOVA, T. V., CHEMODANOVA, L. A., and SALAKHUTDINOV, R. A., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Reactivity and Structures of Phosphorylated Carbonyl Compounds. XI. Study of the Aldol-Enol Equilibrium of Phosphorylated Aldehydes as a Function of Temperature"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 3, Mar 73, pp 568-572

Abstract: The aldol-enol equilibrium of a series of alkyl substituted and non-substituted phosphorylated aldehydes has been investigated as a function of temperature using IR, NMR-^{1}H and NMR-^{31}P spectroscopical analyses. With increasing temperature the nonsubstituted compounds go from the trans-enol form through the aldol form into the cis-enol form. In case of the alkyl substituted phosphorylated aldehyde only the conversion from trans-enol form into the aldol form has been observed. Quantitative determination of the ratios of aldol to trans-enol form has been made.

USSR

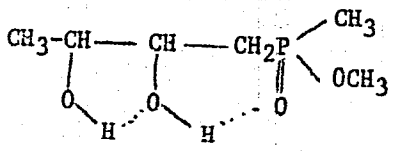
UDC 547.241.422 + 541.571.6

LIORBER, B. G., SOKOLOV, M. P., KHAMMATOVA, Z. M., and RAZUMOV, A. I., Kazan' Chemical Technological Institute Imeni S. M. Kirov

"The Nature of the Hydrogen Bond in Phosphorylated Glycols"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 2, Feb 73, p 438

Abstract: Hydrogen bonding in a phosphorylated glycol -- methyl 2,3-dihydroxybutylmethylphosphinate -- was studied by IR spectroscopy. A single band at 3260 cm^{-1} was observed in a concentrated sample, two bands at 3270 and 3370 cm^{-1} at a 0.02 M concentration in CCl_4, C_2Cl_4, C_6H_6, corresponding to two intramolecular hydrogen bonds.



'A' 'B'

Diluting the glycol with a solvent of low polarity -- dioxane -- breaks the bond A, showing only one IR band at 3388 cm^{-1}.

1/1

USSR

UDC 547.26'118 + 547.292.6

GAZIZOV, M. B., SULTANOVA, D. B., RAZUMOV, A. I., OSTANINA, L. P., SHAKIROV, I. Kh., ZYKOVA, T. V., and SALAKHUTDINOV, R. A., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Reaction of Dialkyl Chlorophosphites With Acetic Acid Acylals"

Leningrad, Zhurnal Obshchey Khimii, Vol 42 (104), No 12, Dec 72, pp 2634-2638

Abstract: It was shown that alpha-chloroethers formed in the reaction of dialkyl chlorophosphites with acetic acid acylals undergo secondary reactions with dialkyl chlorophosphites forming ester-acid chlorides of α-alkoxyethylphosphonic acids. It was shown by IR spectroscopy that the ester-acid chlorides of α-alkoxyethylphosphonic acids exist in two conformations resulting from different orientation of the polar bonds P:O and C-O: conformation A with parallel (cis) or nearly parallel (gauche) orientation of P:O and C-O, and the conformation B with the antiparallel trans orientation of these bonds. Purification methods were proposed for α-chloroethers and dialkyl chlorophosphites by treatment with cateehol chlorophosphite and with acetyl chloride respectively to remove the acetal and trialkyl phosphite impurities.

1/1

USSR UDC 547.26'118+547.2926

GAZIZOV, M. B., SULTANOVA, D. B., BAZUKOV, A. I., OSTANINA, L. P., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Reaction of Alkyl Dichlorophosphites with Acetic Acid Acylals"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 7, Jul 72, p 1647

Abstract: It was found that carboxylic acid acylals (I) react with alkyl dichlorophosphites (II) to give α-alkoxyethylphosphonic acid ester chlorides and the corresponding pyrophosphonates. In this reaction the alkyl dichlorophosphites show electrophilic properties.

1/1

USSR

UDC 632.95

RAZUMOV, A. I., GUREVICH, P. A., and BAYGIL'DINA, S. YU., (Kazan Chemical and Technological Institute

"A Method of Obtaining Phosphorylated Acylals"

USSR Authors Certificate No 311922, filed 31 Mar 70, published 10 Nov 71 (from Referativnyy Zhurnal -- Khimiya, No 10 (II), 1972, Abstract No 10N521P by L. V. Razvodovskaya)

Translation: Compounds of the general formula $RR'P(O)CH_2CH_2OCH(R'')OC(O)R'$ (I) (R,R'=alkyl, aryl, alkoxyl, R''=alkyl, haloalkyl) are obtained by the reaction of $RR'P(O)CH_2CH_2OCH=CH_2$ (II) with carbon acids. To 0.01 mole II (R=R'=EtO) 0.1 mole CF_3COOH is added dropwise, the temperature rises from 20° to 34°; the mixture is stirred and the temperature is lowered to 20°; it is then distilled to give I (R=R'=EtO, R''=CF_3); yield: 52.8%, boiling point 110°/0.7, n^{20}_D 1.4485, d_4^{20} 1.30. I (R=MeO, R'=Ph, R''=CF_3), yield 41.2%, boiling point 188°/0.5, n^{20}_D 1.4967, d_4^{20} 1.32, is obtained by heating the resulting mixture for 3 hours at 60°. Compounds I may have physiological activity.

1/1

USSR UDC 547.26'118+547.292'26

GAZIZOV, M. B., SULTANOVA, D. B., MOSKVA, V. V., MAYKOVA, A. I., and RAZUMOV, A. I.

"Reaction of Diethyl Chlorophosphite With Carboxylic Acid Acylals"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 4, Apr 71, pp 932-933

Abstract: Acetic acid acylals react easily with diethyl chlorophosphite yielding a mixture of products consisting of ethyl acetophosphonate, ethyl α-alkoxyethylphosphonate, an α-chloroether, and acetyl chloride.

1/1

USSR

UDC 547.341

MOSKVA, V. V., NAZVANOVA, G. F., ZYKOVA, T. V., RAZUMOV, A. I., and SALAKHUTDINOV, R. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Derivatives of Substituted Vinylphosphonic Acids. XII. nmr Spectra of P^{31} and H^1 in Substituted Vinylthionophosphonic and Vinylthionophosphonous Acid Dichlorides"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(103), No 2, Feb 72, pp 314-317

Abstract: The acid dichlorides of β-ethoxyvinyl- and 1-ethoxy-1-buten-2--ylthionophosphonic acids were subjected to reductive desulfurization by tributylphosphine to produce the corresponding phosphonous acid dichlorides. Addition of sulfur to these acid dichlorides gives pure substituted vinylthionophosphonic acid chlorides suitable for spectral studies. The nmr spectra of the P^{31} and H^1 in the given substituted vinylphosphonous and vinylthionophosphonic acid dichlorides were studied. The geometric structure of the compounds is determined from nmr data, and the mutual influence of the tri- and tetracoordination atom of phosphorus with the substituents is discussed.

1/1

USSR

UDC 547.341+547.26'118

MOSKVA, V. V., NAZVANOVA, G. F., ZYKOVA, T. V., RAZUMOV, A. I., and CHEMODANOVA, L. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Substituted Vinylphosphonic Acid Derivatives. X. α-Alkyl- β-alkoxyvinylphosphonic and -thiophosphonic Acid Derivatives"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, pp 1680-1684

Abstract: For purpose of a more complete study of α-alkyl- β-alkoxyvinylphosphonic and -thiophosphonic acid derivatives, dialkyl esters of these acids were synthesized by the reaction of their dichlorides with alcohols in the presence of triethylamine or with alkoxides. Hydrolysis of the esters of α-alkyl- β-alkoxyvinylphosphonic and -thiophosphonic acids (7 percent HCl, 80°, 3 hours) gives corresponding phosphorylated aldehydes, which were identified from elemental analysis, by IR and NMR spectra, as well as in the form of their 2,4-dinitrophenylhydrazones. IR and NMR spectroscopy data indicate the presence of keto-enol tautomerism in the aldehydes.

1/1

USSR

UDC 547.341+547.26.118

ISMAILOV, V. M., MOSKVA, V. V., BABAYEVA, T. A., AKHMEDOV, SH. T., RAZUMOV, A. I.,

"Amido Acid Chlorides and Ether Amides of β-Alkoxyvinyl Phosphonic and Thiophosphonic Acids"

Baku, Azerbaydzhanskiy Khimicheskiy Zhurnal, No 2 (84), 1973, pp 52-54

Abstract: Partial amidozation of acid dichlorides of β-alkoxyvinyl phosphonic and thiophosphonic acids leads to obtaining of dialkylamido acid chlorides which with alcohol give ester dialkylamides of β-alkoxyvinyl phosphonic acids. These ester dialkylamides were also obtained by amidizing ether acid chlorides and by alcoholysis of tetraalkyl diamides of these acids. The experimental procedures for synthesizing diethylamides of the acid chloride of β-ethoxyvinyl phosphonic and thiophosphonic acids and the ethyl ester of diethylamide of β-ethoxyvinyl phosphonic acid are given with the yields and other physical and chemical characteristics. A schematic is given for the mutual transformations of the amides, amide acid chlorides, ether acid chlorides and ether amides.

1/1

USSR

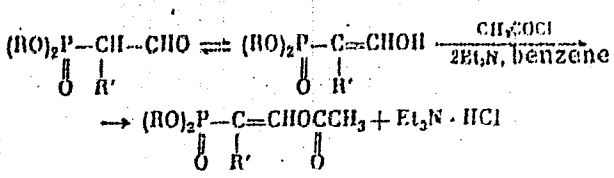
UDC 547.341

MOSKVA, V. V., NAZVANOVA, G. F., ZYKOVA, T. V., RAZUMOV, A. I., REMIZOV, A. B., and SALAKHUTDINOV, R. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Derivatives of Substituted Vinylphosphonic Acids. XII. Acylation of Phosphorylated Aldehydes"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 3, Mar 72, pp 498-501

Abstract: In an attempt to prove keto-enol equilibrium in phosphorylated aldehydes by chemical methods, the authors studied the aldehyde acylation with acetyl chloride in benzene in the presence of triethyl amine, resulting in the synthesis of α-alkyl-β-acyloxyvinylphosphonates from α-phosphorylated propionaldehyde and butyraldehyde.

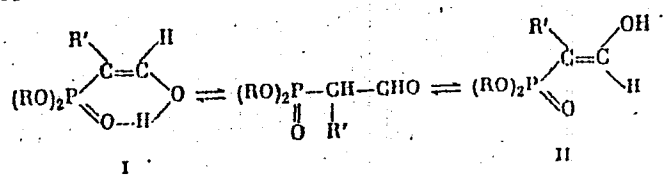


1/2

USSR

MOSKVA, V. V., et al., Zhurnal Obshchey Khimii, Vol 42(104), No 3, Mar 72, pp 498-501

It was found that keto-enol equilibrium with a high concentration of the cis-enol form (I) stabilized by the hydrogen bond between the phosphoryl oxygen and the enol hydroxyl is typical of the starting phosphorylated aldehydes. Spectral data gave no direct proof of the presence of the trans-enol form (II) in the mixture, thus it is only assumed to be present, but in low concentration.



I II

In the products of acylation, nmr spectra show that the phosphorus atom and the alkoxy group are in trans-position relative to the double bond. Since only acylation of the trans-enol form (II) could yield products of such structure, this constitutes chemical proof of its presence. Spectral analysis shows rotational isomerism in α-alkyl-β-acyloxyvinyl phosphonates.

2/2

USSR

UDC 547.26'118+547.29'26

GAZIZOV, M. B., SULTANOVA, D. B., OSTANINA, L. P., ZYKOVA, T. V., SALAKHUTDINOV, R. A., RAZUMOV, A. I., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Reaction of Monochlorophosphites With Acylals of Acetic Acid"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 10, 1971, pp 2167-2171

Abstract: The mechanism of the reactions of aromatic chlorophosphites with α-alkoxyalkyl acetates was studied by physicochemical analysis of the high-boiling fraction of the reaction products. Heating o-phenylene- or o-benzoylene chlorophosphites with α-ethoxyethyl acetate at 50° gave α-ethoxyethylphosphonates which were identified by their IR, ESR, and NMR spectra. Analogous reactions of the cited cyclic chlorophosphites with α-chloroethyl ether or diethyl acetal gave the same products with a phosphonate structure. Thus, the cited reactions proceed by a stepwide mechanism leading to formation of phosphonate and not a phosphite structure. The reaction mechanism involving an intercyclic

1/2

ZIZOV, M. B., et al, Zhurnal Obshchey Khimii, Vol 41, No 10, 1971, pp 2167-2171

electron transfer is outlined. Analysis of the ESR spectrum of one of the products, 2-(α-ethoxyethyl)-2,4-dioxobenzo-1,3,2-dioxaphosphorene, revealed the existence of two stable conformational isomers of the compound, which differ in orientation of methyl protons in relation to the benzene ring and the oxygen of the carbonyl. The ESR spectra of the two compounds are shown and their physical constants are tabulated.

2/2

USSR

UDC 547.241.07

RAZUMOV, A. I., SAVICHEVA, G. A., and SOBCHUK, T. I., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"A Method of Making Phosphorylated Diacetals"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar 72, Author's Certificate No 329183, Division C, filed 6 Jul 70, published 9 Feb 72, p 101

Translation: This Author's Certificate introduces: 1. A method of making phosphorylated diacetals. As a distinguishing feature of the patent, a mixed neutral phosphite reacts with an haloacetal in the presence of heat in an inert gas atmosphere with subsequent isolation of the product by conventional methods. 2. A modification of this method distinguished by the fact that the process is conducted at 140-150°C.

1/1

USSR UDC 547.26'118 + 547.222

GAZIVOV, M. B., SULTANOVA, D. B., RAZUMOV, A. I., OSTANINA, L. P., and RUSALKINA, A. M., Kazan' Chemico-Technological Institute imeni S. M. Kirov

"Reaction of Monochlorophosphites with α-Haloethers"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 11, Nov 1971, pp 2,575-2,576

Abstract: Dialkylchlorophosphines react with α-haloethers in a manner analogous to the first stage of the Arbuzov reaction. In this study the authors reacted such halides with equimolar amounts of dialkyl chlorophosphites, obtaining the corresponding α-alkoxyethylphosphonate ester chlorides. The reaction was analogous to the Arbuzov reaction. The structure of these products was verified from derivative neutral esters, infrared and paramagnetic resonance data, and elemental analysis for phosphorus and chlorine. Physical constants and structural formulas are given.

1/1

USSR UDC 547.341

MOSKVA, V. V., BASHIROVA, L. A., and RAZUMOV, A. I., Kazan' Chemico-Technological Institute imeni S. M. Kirov

"Phosphorylation of Tertiary Alcohols With Phosphorus Pentachloride"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 11, pp 2,577-2,578

Abstract: The reaction of tertiary butyl alcohol with phosphorus pentachloride in benzene led to the formation of an excess of a crystalline complex, which, upon decomposition with SO_2, yielded β-chloroisobutylphosphonyl dichloride. An analogous reaction between dimethylethylcarbinol and PCl_5 was observed.

1/1

USSR

UDC 547.26'118

RAZUMOV, A. I., KRIVOSHEYEVA, I. A., LIORBER, B. G., TARZIVOLOVA, T. A., and PAVLOV, V. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Investigation in the Series of Phosphinic and Phosphinous Acid Derivatives. LXXXII. Kinetics of Hydrolysis of Diallylphosphinic Acid Esters"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 3, Mar 72, pp 496-498

Abstract: Biologically active compounds have been found among the diallylphosphinic acid esters. The authors investigate the kinetics of uncatalyzed hydrolysis of these esters in an effort to determine the effect of the structure of the alkoxy radicals on their reactivity. Compounds of the $(CH_2=CHCH_2)_2$-P(O)OR type containing saturated radicals of normal and branched structure as well as unsaturated radicals with double and triple bonds in the ester group (R = CH_3, C_2H_5, n.-C_3H_7, iso-C_3H_7, C_4H_9, iso-C_4H_9, sec.-C_4H_9, $CH_2=CH$, $CH_2=CHCH_2$, $CH_3CH=CHCH_2$, $CH\equiv CCH_2$) were selected for study. The kinetics of hydrolysis were checked by titration. Preliminary experiments showed that diallylphosphinic acid and the corresponding alcohol formed during the reaction have no effect on the course of hydrolysis. Diallylphosphinic acid needed for the experiments was synthesized by treating diallylphosphinic

1/2

USSR

RAZUMOV, A. I., et al., Zhurnal Obshchey Khimii, Vol 42(104), No 3, Mar 72, pp 496-498

acid chloride with equivalent quantities of water. The experimental data indicate that the hydrolysis of these esters takes place with splitting of the C-O bond. The monomolecular reaction is apparently the rate determining step for the reaction of the esters studied. The results of the work may be useful in studying the alkylating capacity of diallylphosphinic acid esters.

2/2

USSR

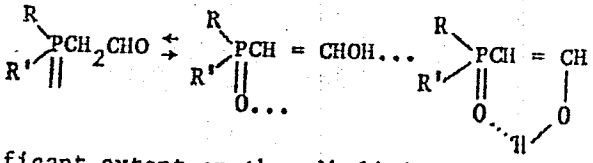
UDC 547.241

RAZUMOV, A. I., SOKOLOV, M. P., ZYKOVA, T. V., LIORBER, B. G., SAVICHEVA, G. A., SALAKHUTDINOV, R. A.

"Reactivity and Structure of Phosphorylated Carbonyl Compounds. IX. Ketoenol Equilibrium of Phosphorylated Acetaldehydes"

Leningrad, Zhurnal Obshchey Khimii, Vol XLII (CIV), No 1, 1972, pp 47-51

Abstract: Tautomeric conversions of dialkoxyphosphonyl and arylalkoxyphosphinyl acetaldehydes have been described previously (A. I. Razumov, et al., ZhOKh, No 41, 1954, 1971; No 41, 2164, 71]. The study of alkylalkoxyphosphinyl acetaldehydes from this point of view is a logical development of this pervious work. The methods of infrared and nuclear magnetic resonance ^{1}H and ^{31}P spectroscopy has been used to show that the ketoenol equilibrium of phosphorylated acetaldehydes



depends to a significant extent on the alkalinity of the P=O radical, spatial

1/2

USSR

RAZUMOV, A. I., et al., Zhurnal Obshchey Khimii, Vol XLII (CIV), No 1, 1972, pp 47-51

effects and the effects of solvents. The calculated ketoenol equilibrium constants of both the undeveloped substances and 20, 10 and 5 percent molar solutions of them in carbon tetrachloride and the free energy ΔF are tabulated. In the aliphatic series, with an increase in the alkalinity, successive shifting of the equilibrium toward the enol form is observed. The values of ΔF found correlate satisfactorily with the Kabachnik constants [T. A. Mastryukova, M. I. Kabachnik, Usp. khim., No 38, 1751, 1969]. On dissolving the investigated substances in carbon tetrachloride (20, 10 and 5% molar solutions) a gradual shift in the aldo direction takes place.

2/2

USSR

UDC 547.341

RAZUMOV, A. I., MOSKVA, V. V., NAZVANOVA, G. F., ZYKOVA, T. V.

"Derivatives of Substituted Vinylphosphonic Acids. XI. Deuterated Substituted Vinylphosphonates"

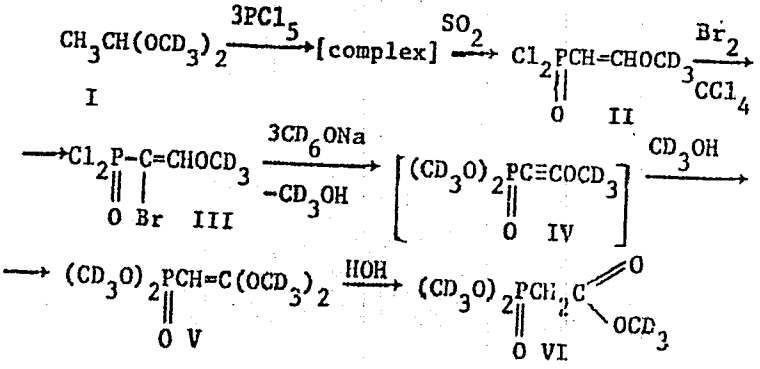
Leningrad, Zhurnal Obshchey Khimii, Vol XLII (CIV), No 1, 1972, pp 51-53

Abstract: For more complete proof of the structure of phosphorylated ketene acetals and the proposed interaction scheme [V. V. Moskva, et al., ZhOKH, No 41, 1495, 1971] including dehydrohalogenation of phosphonate with subsequent addition of alcohol to the alkoxyethinylphosphonate formed, acetaldehyde di-methyl-d_6-acetal was phosphorylated by phosphorus pentachloride to obtain the deuterated dichloroanhydride of β-methoxy-d_3-vinylphosphonic acid which was converted to the acid dichloride of α-bromo-β-methoxy-d_3-vinylphosphonic acid by bromination. The interaction of α-bromo-β-methoxy-d_3-vinylphosphonate with sodium methylate-d_3 leads to the formation of deuterated phosphonoketene acetal. Paramagnetic resonance spectra are presented confirming the scheme for the given reaction and the structure of all the mentioned products. The successive conversion scheme is represented as follows:

1/2

USSR

RAZUMOV, A. I., et al., Zhurnal Obshchey Khimii, Vol XLII (CIV), No 1, 1972, pp 51-53



2/2

USSR

UDC 547.241

RAZUMOV, A. I., SAVICHEVA, G. A., ZYKOVA, T. V., SOKOLOV, M. P., SMIRNOVA, G. G., LIORBER, B. G., SALAKHUTDINOV, R. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Reactivity and Structure of Phosphorylated Carbonyl Compounds. 8.NMR and IR Spectra of Arylalkoxyphosphinylacetaldehydes"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 10, 1971, pp 2164-2167

Abstract: In a continuation of the previous study of dialkoxyphosphorylacetaldehydes, tautomerism in alkoxyarylphosphorylacetaldehydes (I) was studied on the theory that an aryl substituent at the P atom may affect the aldol-enol equilibrium. Measurements of the P-31 chemical shift in compounds I hinted at a shift in equilibrium toward the enol form. This was confirmed by NMR spectra of 20% I solutions in carbon tetrachloride: the NMR band of α-ethylenic proton revealed the presence of the enol form. The IR spectra of nondiluted I compounds indicated simultaneous existence of two enol forms: B with intermolecular and 1/2

USSR

RAZUMOV, A. I., et al, Zhurnal Obshchey Khimii, Vol 41, No 10, 1971, pp 2164-2167

C with strong intramolecular hydrogen bonds in addition to aldol form. The IR spectra of 5-20% I solutions in carbon tetrachloride reflected a sequential shift toward the aldol form with increasing dilution, so that practically only the aldol form existed in the 5% solutions. The IR spectral data showed that in triethylamine solutions of I, in contrast to carbon tetrachloride solutions, the equilibrium shifts toward the B chelated enol form which incorporates triethylamine.

2/2

USSR

UDC 547.241

MUKHACHEVA, O. A., NIKOLAYEVA, V. G., and RAZUMOV, A. I., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Rearrangement of Diphenylphosphinylacetohydroxamic Acid"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8 Aug 71, pp 1873-1874

Abstract: Using diphenylphosphinylacetohydroxamic acid as an example, the authors studied the Lossen rearrangement, which is characteristic of acyl derivatives of hydroxamic acids. Benzoylation of potassium diphenylphosphinylacetohydroxamate gives benzoyl diphenylphosphinylacetohydroxamate, which on heating in an alkaline aqueous solution undergoes an intramolecular rearrangement with elimination of the carboxyl ion and the formation of an isocyanate. The latter gives N,N'-bis(diphenylphosphinylmethyl)urea in the presence of water. The rearrangement of diphenylphosphinylacetohydroxamic acid directly to the isocyanate was observed on heating with excess triethyl orthoformate. The final rearrangement products were N,N'-bis(diphenylphosphinylmethyl)urea and the ethyl ester of N-diphenylphosphinylmethylcarbanic acid.

1/1

USSR

UDC 547.341

MOSKVA, V. V., RAZUMOV, A. I., SAZONOVA, Z. YA., and ZYKOVA, T. V., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Reaction of Phosphonoacetic Aldehydes with Secondary Amines"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, p 1874

Abstract: The reaction of phosphonoacetaldehydes with secondary amines in toluene in the presence of catalytic quantities of p-toluenesulfonic acid gives β-dialkylaminovinylphosphonates (phosphorylated enamines) in good yields. The structure of the phosphorylated enamines is confirmed by IR and PMR spectral data.

1/1

USSR

UDC 547.241

RAZUMOV, A. I., YAFAROVA, R. L., and ISMAGILOV, R. K., Kazan Chemical-Technological Institute imeni S. M. Kirov

"An Investigation into a Series of Derivatives of Phosphinic and Phosphinous Acids. LXXV. Synthesis and Certain Properties of Esters and Hydrazides of Phosphinylmethylmalonic Acid"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 5, May 1971, pp 1022-1024

Abstract: In studying the derivatives of phosphorylated carboxylic acids, which have shown high biological activity, the synthesis of phosphorylated dibasic carboxylic acids was used as a basis for the present work. The synthesis of the esters proceeded as follows:

$$\begin{matrix}A\\B\end{matrix}\!\!>\!\!P\text{--}OH + (CH_2{=}O)_x + CH_2(COOC_2H_5)_2 \longrightarrow \begin{matrix}A\\B\end{matrix}\!\!>\!\!P(O)CH_2CH(COOC_2H_5)_2 + C_2H_5OH$$

The resulting liquids were colorless, odorless and miscible with alcohol and acetone. The dihydrazide was produced in high yields from the esters as follows:

1/2

USSR

RAZUMOV, A. I., et al., Zhurnal Obshchey Khimii, Vol 41, No 5, May 1971, pp 1022-1024

$$R_2P(O)CH_2CH(COOC_2H_5)_2 + 2NH_2{-}NH_2 \longrightarrow R_2P(O)CH_2CH(CONH{-}NH_2)_2 + 2C_2H_5OH$$

The product was a crystalline compound soluble in water and alcohol, but not ether.

2/2

USSR

UDC 547.241+547.27

KRASIL'NIKOVA, Ye. A., RAZUMOV, A. I., BAYANDINA, Ye. V., and ZARINOVA, V. G.

"The Reaction of the Ethyl Ester of Diphenylthiophosphinic Acid with α-Halide Substituted Simple Esters"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 5, May 1971, pp 1173-1174

Abstract: The ethyl ester of diphenylthiophosphinic acid reacts with α-halide substituted simple esters. The following products were separated from the reaction mixture: diphenylalkoxyalkylphosphine sulfides, the ethyl ester of diphenyldithiophosphinic acid, and diphenyldi(alkoxyalkyl)-phosphonium chlorides.

1/1

USSR

UDC 547.341

MOSKVA, V. V., ZYKOVA, T. V., ISMAILOV, V. M., and RAZUMOV, A. I., Kazan Institute of Chemical Technology imeni S. M. Kirov

"Substituted Vinylphosphonic Acid Derivatives. IV. Geometric Isomerism in Substituted Vinylphosphonic Acid Dichlorides with One Proton at the Double Bond"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 1, Jan 71, pp 93-95

Abstract: Using the NMR method, the authors studied the acid dichlorides of substituted vinylphosphonic acids containing a proton at the double bond in the α- or β-position, viz. α-chloro-β-ethoxyvinylphosphonic, α-bromo-β-ethoxyvinylphosphonic, α-bromo-β-ethoxyvinylthiophosphonic, β-chloro-β-ethoxyvinyl phosphonic and β-methoxy-α-propenylphosphonic acids. Their geometric structure is assigned on the basis of the NMR spectra.

1/1

USSR

UDC 547.341

MOSKVA, V. V., ISMAILOV, V. M., and RAZUMOV, A. I., Kazan Institute of Chemical Technology imeni S. M. Kirov

"Substituted Vinylphosphonic Acid Derivatives. III. Hydrolysis of β-Alkoxyvinylthiophosphonate Esters to the Corresponding Aldehydes"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 1, Jan 71, pp 90-92

Abstract: Acid hydrolysis of dialkyl esters of β-alkoxyvinylthiophosphonic acids (5-6 percent HCl, 90-100°, 3-4 hours) gives the corresponding thiophosphonoacetaldehydes. These products were identified from constants, elementary analysis data, IR spectra, as well as by their 2,4-dinitrophenylhydrazones.

1/1

USSR

UDC 547.341

MOSKVA, V. V., ISMAILOV, V. M., ZYKOVA, T. V., and RAZUMOV, A. I., Kazan Institute of Chemical Technology imeni S. M. Kirov

"Substituted Vinylphosphonic Acid Derivatives. V. Alcoholysis of Substituted Vinylphosphonic and -thiophosphonic Acid Chlorides"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 1, Kan 71, pp 96-99

Abstract: The action of alcohols on α-halo-β-alkoxyvinylphosphonic and -thiophosphonic acid dichlorides in the presence or absence of a tertiary amine results in the formation of dialkyl esters of these acids. Alcoholysis of α-chloro-β alkoxyvinylphosphonic acid dichlorides in excess ethanol gives the corresponding full esters, in which the position of substitutents at the double bond is retained. Alcoholysis of β-chloro-β-ethoxyvinylphosphonic acid dichloride with excess ethanol gives the ethyl ester of diethylphosphono-acetic acid. The structure of the resultant compounds was proposed on the basis of IR and PMR spectra.

1/1

USSR

UDC 547.341+547.381

MOSKVA, V. V., BASHIROVA, L. A., ZYKOVA, T. V., and RAZUMOV, A. I.

"Reaction of Phosphorus Pentachloride With Acrolein Acetals"

Leningrad, Zhurnal Obshchey Khimii, Vol XL, No 12, Dec 70, p 2764

Abstract: The unsymmetrical double bond and acetal group, and the two reaction centers of acrolein acetal (I), can be phosphorylated with phosphorus pentachloride. The reaction is assumed to begin with replacement of the alkoxy group by a halogen, to form the α-chlorallyl ethyl ether (II), which may be either directly phosphorylated by the phosphorus pentachloride, or else isomerized γ-chloro-α-propenyl ethyl ether (III). Owing to some polarization of the double bond in (II) and (III), electrophilic attack is directed in both cases to the β-carbon atom with formation of a single complex, decomposition of which with gaseous sulfur dioxide leads to formation of α-chloromethyl-β-ethoxyvinylphosphonic acid dichloride (V).

Heating of (I) in 80 ml of benzene at 8-10° for 1 hr, followed by addition of phosphorus pentachloride, heating to room temperature, agitation at 30° for 12 hr, decomposition by gaseous sulfur dioxide and finally removal of solvent and volatile products, yielded 65.6% of $C_5H_8Cl_3O_2P$.

1/1

USSR

UDC 547.341

RAZUMOV, A. I., LIORBER, B. G., SOKOLOV, M. P., and ZYKOVA, T. V., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Reaction of Phosphorylated Acetaldehydes With Allyl Phosphonous Acid Diamides"

Leningrad, Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 2106-2107

Abstract: Studies on the conversion of phosphorylated aldehydes indicate that in reactions with allyl phosphonous acid diamides they yield enamines. It is assumed that the reaction passes through the enolic form since the presence of basic agents (in this case allyl phosphinous acid diamides) moves the keto-enol equilibrium of the phosphorylated acetaldehydes toward the enol forms. The structure of the synthesized compounds is supported by both IR and PMR spectra. They show absorption bands at 1616 cm^{-1} ($\nu C=C$), 1227 cm^{-1} ($\nu P=O$), 1170 and 1030 cm^{-1} ($\nu P-O-C_2H_5$). The NMR spectra show peaks for CH_3, CH_2 and OCH_2.

1/1

USSR

UDC 547.241

KRASIL'NIKOVA, Ye. A., MOSKVA, N. A., and RAZUMOV, A. I., Kazan' Chemical-Technological Institute imeni S. M. Kirov

"Reaction of Ethyl Diethylthiophosphinite With Chloroacetic Ester"

Leningrad, Zhurnal Obshchey Khimii, Vol XL, No 12, Dec 70, p 2765

Anstract: The above reaction yields, in addition to the basic product of the Arbuzov reaction [diethylcarbethoxymethylphosphine sulfide (III)], also diethylbis(carbethoxymethyl)phosphonium chloride (IV) and ethyl diethyldithiophosphinate (V).

The structure of (III) was confirmed with infrared analysis.

1/1

USSR

UDC 547.241+547.26'118

RAZUMOV, A. I., SAVICHEVA, G. A., ZYKOVA, T. V., SOKOLOV, M. P., LIORBER, B. G., and SALAKHUTDINOV, R. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Reactivity and Structure of Phosphorylated Carbonyl Compounds. Part VII. NMR and IR Spectra of Dialkoxyphosphonylacetaldehydes"

Leningrad, Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 1954-1957

Abstract: The considerable value of phosphorylated carbonyl compounds lies in the fact that they, like β-carbonyl compounds, exhibit keto-enolic tautomerism. The application of polarography and IR spectroscopy (in earlier studies) indicates that some β-phosphorylated aldehydes are mixtures of keto- and cis-enolic forms whose equilibrium depends on both the solvents and the pH of the aqueous solutions. This paper reports on tautomeric transformations of diethoxy- (I) and diisopropoxyphosphonylacetaldehydes (II) using NMR and IR spectroscopy. The tautomerism of both compounds was studied from the NMR spectra of (I) and its 5, 10 and 20% solutions in carbon tetrachloride, 30 and 50% solutions in triethylamine and from the NMR spectra of aldehyde (II) and its 10% solution in triethylamine at 20°C.

USSR

RAZUMOV, A. I., et al.; Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 1954-1957

Readings of the NMR spectra were made on a YaMR-5535 spectrometer, the p31 NMR spectra were read on the RYa-2303 spectrometer and the IR spectra were read on UR-10 and UR-20 units. Both NMR and IR spectra indicate that dialkoxyphosphenylacetaldehydes and their solutions in CCl_4 are an aldo- form with a small admixture of the enolic structure. In triethylamine, the chelated enolic structure is predominant.

2/2

USSR

UDC 547.241

RAZUMOV, A. I., LIORBER, B. G., ZYKOVA, T. V., BAMBUSHEK, I. YA.,
Kazan' Chemical-Technological Institute imeni S. M. Kirov, Kazan,
Ministry of Higher and Secondary Specialized Education RSFSR

"Studies in the Series of Phosphinous and Phosphinic Acids. LXXIV. Intermediate Products of Arbuzov's Rearrangement of the Esters of Monoalkylphosphinous Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70,
pp 2009-2010

Abstract: In the reaction of methyl iodide with saturated monoalkylphosphinous esters having branched alkoxyl groups, intermediate products may be isolated provided the reaction is carried out at a cold temperature. These compounds are colorless crystalline materials which can be stored for prolonged periods in cold. They are soluble to a limited extent in benzene and more soluble in chloroform and methylene chloride. At room temperature or on heating they decompose according to the second phase of the Arbuzov rearrangement, forming esters of alkylmethylphosphinic acids. According to the data from NMR spectroscopy these intermediate products 1/1 exist in the ionized form in both polar and nonpolar solvents.

USSR

UDC 538.27:547.341

RAZUMOV, A. I., LIORBER, B. G., ZYKOVA, T. V., BAMBUSHEK, I. YA., Kazan' Chemical-Technological Institute imeni S. M. Kirov, Kazan, Ministry of Higher and Secondary Specialized Education RSFSR

"Studies of the Derivatives of Phosphinic and Phosphinous Acids. LXVI. The Problem of Interaction Between the Double Bond and the Phosphorus Atom in Allylphosphinates and Phosphonites"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1704-1707

Abstract: As a continuation of earlier studies, the previously synthesized derivatives of allylphosphinous- and -phosphinic acids were subjected to NMR spectroscopic analysis and compared with propyl analogues. It was determined that for all pairs examined the chemical shift of the phosphorus nucleus in the allyl derivatives was higher than in propyl analogues. Introduction of another allyl group resulted in a further shift of δ_P towards the stronger field. Since the symmetry around the phosphorus atom was retained, the effect observed was due exclusively to the double bond introduced. Evidently the π-electrons of the C:C bonds interacted with

1/2

USSR

RAZUMOV, A. I., et al, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1704-1707

free phosphorus electrons from the d-orbitals, thus increasing its electron density. This was accompanied by delocalization of the electron cloud in the allyl radical, and the C:C bond electrons affect the d-orbitals.

2/2

USSR

UDC 547.341

RAZUMOV, A. I., LIORBER, B. G., SOKOLOV, M. P. Kazan Chemical-Technological Institute imeni S. M. Kurov

"Study of a Series of Derivatives of Phosphonic and Phosphonous Acids" LXVIII. The Diamides of Allylphosphinous Acids, Their Synthesis and Properties.

Leningrad, Zhurnal Obshchei Khimii, Vol 40, No 6, Jun 70, pp 1252-1255

Abstract: The reaction of allyl dichlrophosphine with secondary amines in an inert solvents (ether, hexane) in the presence of triethylamine or excess secondary amine yields the corresponding diamides of allylphosponous acid (I) I easily add Group VI elements, such as sulfur (in polar solvents) or selenium (without solvent), and thereby form diamides of alkylthioor allylselenophosphonic acids. The IR spectra of the diamides were studied.

1/1

USSR

UDC 547.341 + 546.185'131

MOSKVA, V. V., ISMAILOV, V. M., and RAZUMOV, A. I., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Substituted Vinylphosphonic Acid Derivatives. II. Interaction of Phosphorus Pentachloride With Acetals"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 7, Jul 70, pp 1489-1492

Abstract: The article clarifies an earlier communication by the authors which imprecisely gave the structure of the products resulting from the decomposition of complexes of acetals of acetaldehyde with phosphorus pentachloride by sulfur dioxide. Experiments were repeated many times and IR and PMR spectra were used to identify the reaction products. The interaction of acetals of acetaldehyde with phosphorus pentachloride in benzene or carbon tetrachloride at 5-25° results in the formation of a complex, the subsequent decomposition of which with sulfur dioxide or hydrogen sulfide at 5-10° leads to the formation of β-alkoxyvinylphosphonic and β-alkoxyvinylthiophosphonic acid dichlo-

1/2

USSR

MOSKVA, V. V., et al., Zhurnal Obshchey Khimii, Vol 40, No 7, Jul 70, pp 1489-1492

rides respectively. Thermal decomposition of the acetal-phosphorus pentachloride complex results in the formation of α-chloro-β-alkoxy-vinylphosphonic acid dichlorides. The article suggests a mechanism for the formation of these products.

2/2

USSR UDC 547.241

KRASIL'NIKOVA, YE. A., MOSKVA, N. A., RAZUMOV, A. I., Kazan' Chemical-Technological Institute imeni S. M. Kirov, Kazan, Ministry of Higher and Secondary Specialized Education RSFSR

"Study of the Phosphinous and Phosphinic Acid Derivatives. LXXI. Reaction of the Esters of Diethylthiophosphinous and Diethylphosphinous Acids With Acetaldehyde"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, pp 2001-2004

Abstract: The reaction of ethyl esters of diethylthiophosphinous acid (I) and diethylphosphinous acid (II) with acetaldehyde is reported. Both esters react by the same mechanism with acetaldehyde. The reaction is complicated in case of (I) by decomposition of the starting material with the formation of triethylphosphine and the ethyl ester of diethyldithiophosphinic acid. It is proposed that the reaction of ethyl esters of (I) and (II) with acetaldehyde is a nucleophilic replacement reaction probably going through the formation of an intermediate cyclic complex. The proton is split

USSR

KRASIL'NIKOVA, YE. A., et al, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, pp 2001-2004

off by oxygen or sulfur atoms while the phosphorus atom is attacked by the nucleophilic carbonyl oxygen. As a result, the ester group is removed as an alcohol or a mercaptan. Product identification was made by IR and TLC analysis.

2/2

USSR

UDC 547.241

MUKHACHEVA, O. A., GOR'KOVA, S. A., NIKOLAYEVA, V. G., RAZUMOV, A. I., Kazan' Chemical-Technological Institute imeni S. M. Kirov, Kazan, Ministry of Higher and Secondary Specialized Education RSFSR

"Studies in the Series of Phosphinous and Phosphinic Acids. LXII. Phosphorylated Hydroxamic Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, pp 2004-2009

Abstract: The following method was developed for synthesis of phosphorylated hydroxamic acids. Hydroxylamine hydrochloride was suspended in absolute methanol, and potassium methoxide was added with stirring. After removing the precipitated KCl, a methanol solution of ethyl ester of β-diethylphosphinylpropionic acid was added, followed by more potassium methoxide to keep the pH at 9-10. The reaction was carried out in dry nitrogen atmosphere. After 10 hrs some crystalline potassium salt of the β-diethylphosphinyl-propionhydroxamic acid was obtained, the remaining product staying in solution. Next, the ion exchange resin KB-4 was added to the above mixture, which was allowed to stand for 6-7 hrs until the pH

1/2

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202620014-2"

USSR

MUKHACHEVA, O. A., et al, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, pp 2004-2009

became <7. The resin was filtered off, most of the solvent evaporated, and the residue poured into ether, from which crystalline β-diethylphosphinylpropionohydroamic acid was obtained, m.p. 106-107°. Other analogues were obtained in a similar fashion. Their IR spectra showed bands at 1680-1665 and 1650-1640 cm^{-1} (C:O), 1565-1540 cm^{-1} (NH), 1180-1140 cm^{-1} (P:O), and at 3170-3140 cm^{-1} (NH and OH). Introduction of the phosphoryl group did not change basic properties of hydroxamic acids. Biologically, they appeared as weak antidotes against phosphorus organic toxins. The authors thank L. A. CHEMODANOVA for taking the IR spectra.

2/2

USSR

UDC 547.341 + 542.955.1.2

LIORBER, B. G., KHAMMATOVA, Z. M., TARZIVOLOVA, T. A., RAZUMOV, A. I., Kazan' Chemical-Technological Institute imeni S. M. Kirov, Kazan, Ministry of Higher and Secondary Specialized Education RSFSR

"Studies of the Derivatives of Phosphinic and Phosphinous Acids. LXX. Esters of Epoxidized Phosphinic Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1699-1704

Abstract: Reaction of unsaturated phosphinic acid esters containing allyl type radicals with 65-80% peracetic acid gave a series of β,γ-epoxyphosphinic acids. The structures of the products obtained were determined by IR and NMR spectra. The epoxides could be opened by aqueous HCl, yielding β,γ-dihydroxybutylmethylphosphinic acid esters. The reaction occurred smoothly, probably because of the inductive effect of the methyl group, which counteracted the influence of the P:O group. The epoxides were tested for chemosterilant activity against the common house fly: the monoepoxides were found inactive and the diepoxides showed sterilizing activity.

1/1

USSR

UDC: 547.298.6

ISMAGILOV, R. K., RAZUMOV, A. I., YAFAROVA, R. L., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Research in the Series of Phosphinic and Phosphinous Acid Derivatives. LXXXIV. Methyl(Aryl)-bis(carbohydrazinomethyl) phosphine Oxides and Some of Their Properties"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 6, Jun 72, pp 1248-1249

Abstract: Continuing their research on synthesis of dihydrazides of phosphorylated dibasic carboxylic acids, the authors investigated compounds containing both carbohydrazinoalkyl groups associated with the phosphorus atom, i.e. compounds of the type $RP(O)(CH_2C(O)NHNH_2)_2$. The alkyl(aryl)bis(carboethoxymethyl)phosphine oxides required for the synthesis were obtained by reacting ethyl triethylstannylacetate with primary dichlorophosphines with subsequent oxidation of the tertiary phosphines:

$$RPCl_2 + 2(C_2H_5)_3SnCH_2COOC_2H_5 \longrightarrow RP(CH_2COOC_2H_5)_2 + 2(C_2H_5)_3SnCl$$
$$RP(CH_2COOC_2H_5)_2 + H_2O_2 \longrightarrow RP(O)(CH_2COOC_2H_5)_2 + H_2O$$

The synthesized tertiary phosphines add sulfur with heating. Methyl(aryl) bis(carboethoxymethyl)phosphine oxides react with hydrazine hydrate to form

1/2

USSR

ISMAGILOV, R. K., et al., Zhurnal Obshchey Khimii, Vol 42(104), No 6, Jun 72, pp 1248-1249

the corresponding dihydrazides:

$$RP(O)(CH_2COOC_2H_5)_2 + 2NH_2NH_2 \rightarrow RP(O)[CH_2C(O)NHNH_2]_2 + 2C_2H_5OH$$

The properties of the synthesized compounds are summarized in tabular form.

2/2

Organophosphorous Compounds

USSR

UDC: 547.241'26'118

[redacted] KRASIL'NIKOV, Ye. A., ZYKOVA, T. V., SINITSYNA, N. I., SALAKHUTDINOV, R. A., BANKOVSKAYA, N. N.

"Research in the Series of Phosphinic and Phosphinous Acid Derivatives. LXXXV. Electron Effects in Molecules of Certain Derivatives of Trivalent Phosphorus in the Ground State"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 6, Jun 72, pp 1250-1253

Abstract: It is shown that gradual intrcduction of the thioalkyl electron-acceptor radical in compounds of the R_2PSR', $RP(SR')_2$ and $P(SR)_3$ type leads to displacement of the resonance signal of the nucleus of the atom of tricoordinated phosphorus toward a weaker field, which is probably due to delocalization of an unshared electron pair in the phosphorus atom to the vacant d-orbitals of sulfur. It is found that nmr spectroscopy of the compounds studied can be used in discussing electron interactions between PIII and the aromatic nucleus in the ground state of the molecule.

1/1

USSR

UDC 615.214:547.349

RAZUMOV, A. I., LIORDER, B. G., ZAIKONNIKOVA, I. V., URAZAYEVA, L. G., and TARZIVOLOVA, T. A., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Studies in the Series of Phosphinic and Phosphinous Acid Derivatives. LXXXVIII. Synthesis of Diallylphosphinic Acid Esters and Amides and Their Biological Activity"

Moscow, Khimiko-Farmatsevticheskiy Zhurnal, Vol 6, No 12, Dec 72, pp 24-28

Abstract: Addition of diallylphosphinic acid (I) with vigorous stirring to a toluene suspension of respective alcohols or amines, followed by a 3 hr reaction at 100° produced the desired esters and amides upon cooling. The following $(C_3H_5)_2P(:O)R$ products were obtained: R, b.p.°, d_4^{20}, and n_D^{20} being reported: $OCH_2CH(CH_3)_2NH_2 \cdot HCl$, -, -, -; $OCH_2(CH_2)_7CH_3$, 145-6/0.07 mm, 0.9467, 1.4660; $OCH_2(CH_2)_{10}CH_3$, 156-7/0.07 mm; 0.9301, 1.4670; $N<\begin{smallmatrix}CH_2CH_2\\CH_2CH_2\end{smallmatrix}>CH_2$, 112-4/0.05 mm, 1.0279, 1.5600; $N<\begin{smallmatrix}CH_2CH_2\\CH_2CH_2\end{smallmatrix}>O$, 132-4/0.05 mm 1.0950, 1.5100; $N(C_3H_7)_2$, 117-9/0.04 mm, 0.9535, 1.4810; and $N(C_4H_9)_2$, 124-6/0.04 mm, 0.9376, 1/2

USSR

RAZUMOV, A. I., et al., Khimiko-Farmatsevticheskiy Zhurnal, Vol 6, No 12, Dec 72, pp 2 -28

1.4770. Propargyl ester of diallylphosphinic acid -- the most active agent -- was prepared by mixing the acid chloride of (I) with the alcohol and triethylamine in ether and stirring for 4 hrs. The product boiled at 97-8°/0.06 mm, d_4^{20} = 1.0529, and n_D^{20} = 1.4900. Acid chloride of (I) added to 3-aminobutanol-1 in 200 ml of dichloroethane followed by a 2 hr reaction at 60°, removal of the dichloroethane, addition of sodium alkoxide in absolute ether yielded 3-aminobutyl ester of (I) after centrifugation and repeated filtration; b.p. 173-6°/ 10^{-4} mm, d_4^{20} = 1.0466, n_D^{20} = 1.4900.

2/2

USSR

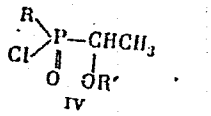
UDC 547.26'118+547.1926

GAZIZOV, M. B., SULTANOVA, D. B., RAZUMOV, A. I., OSTANINA, L. P., and GALYAUTDINOVA, A. A.

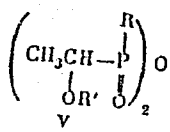
"Interaction of the Dichlorides of Trivalent Phosphorus with Acetic Anhydride in the Presence of α-Chloroethers"

Leningrad, Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, p 213

Abstract: Dialkylchloro phosphites react with the anhydrides of carboxylic acid (I) with the formation of α-ketophosphonic esters (M. B. Gazizov, et al., ZhOKh, No 39, 2600, 1969). The compounds (I) and the dichlorides of trivalent phosphorus (II) react slowly with each other at room temperature and more intensely at 50° with the formation of polymer products. However, in the presence of α-chloroethers (III) at 50° for 10 hours, the compounds (I) and (II) form the corresponding acid chlorides (IV) and anhydrides (V) of α-alkoxyethyl phosphonic and phosphonous acids.



IV



V

1/2